

2003

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Recommended Citation

Sahay, Sundeep (2003) "Global software alliances: the challenge of 'standardization,'" *Scandinavian Journal of Information Systems*: Vol. 15 : Iss. 1 , Article 11.

Available at: <http://aisel.aisnet.org/sjis/vol15/iss1/11>

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Global software alliances: the challenge of 'standardization'

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Abstract

Global Software Alliances (GSAs) are a relatively new organizational form that firms are increasingly adopting to meet their software development needs. These relationships are fraught with complexity given the temporal, spatial and cultural separation of the firm contracting out the software development work and the firm doing the development. In this paper, we focus on the challenge of standardization that contributes significantly to the ongoing complexity. The nature of the standardization problem is elaborated, and the tensions that are associated in their implementation are analyzed. A key implication arising from the paper is the need to broaden the technical focus on standards that have existed in prior research, and to give increased emphasis on management practices. Latour's idea of "circulating reference" is introduced to analyze the question of "what is lost, what is gained, and what remains invariant in the process of translation?"

Keywords

Standardization, Global Software Alliances, Management Practices, Circulating Reference, India.

Introduction: the standardization challenge in global software work

Globalisation is a key characterization of transformations in a multiplicity of domains at the turn of the twenty-first century. One key domain of change concerns international business environments and organizational forms that are significantly being reshaped as part of a new scenario that have variously been labelled as the 'new economy', 'digital economy,' 'network society,' or the 'information age.' A distinctive and defining aspect of these new organizational forms is the manner in which space and time have become the primary medium through which to rethink the nature of the organization (Friedland and Boden 1997). An example of one such new organizational form is the 'Global Software Alliance' (GSA), a term we use to describe organizations established to enable the conduct of Global Software Work (GSW). GSW refers to 'software work undertaken at geographically separated locations across national boundaries in a coordinated fashion involving real time and asynchronous interaction.' GSW can thus include work done across global borders through outsourcing, alliances, or subsidiary arrangements. We use the term GSA to describe in generic terms organizational forms established to support the conduct of GSW.

A GSA can be conceptualized as a relatively long-term inter-organizational relationship established between the outsourcing and outsourced organizations based in different countries to enable software development. This development occurs primarily in shared electronic domains with developers primarily being located in the physical premises of their respective organizations (referred to as 'offshore'). Taking advantage of the increasing sophistication and capacity of telecommunication links and relatively lower labour costs in the outsourcing organization, in GSAs work is done primarily in electronic spaces created through the use of information and communication technologies (ICTs) like videoconference and email. While the physical travel of personnel between the vendor and contracting organizations can never be completely eliminated, the ongoing quest of

both sides is to optimize costs by minimizing travel and finding the appropriate blend between onsite and offshore presence of developers. As GSAs seek to find synergies between remote and face-to-face work, time, space, organizational and national boundaries are recombined in novel ways where the experience of 'here' and 'now' loses its immediate spatio-temporal referents and becomes tied to and contingent on actors and actions at a distance.

Software development is a knowledge-intensive activity, and typifies work in the present 'knowledge' or 'network society. An analysis of such work in practice can provide interesting insights into the kind and extent of work that can be effectively conducted in conditions of globalisation. GSW takes place within an extremely dynamic and diverse global marketplace that is populated by organizations big and small from countries both developed and developing. The GSW arena is thus unique in that firms need not be handicapped fatally by existing size, and can potentially make an impact based on their knowledge competencies, ability to leverage technology and the cost advantages they offer. Diversity, complexity and uniqueness are thus inherent to GSW making them an exciting and relatively unexplored domain of study. Unlike manufacturing and professional services like consultancies that have been studied in the past, software development in global settings remains empirically largely unexamined.

Prior to GSW arrangements being possible, global work was primarily conducted by large multi national corporations (MNCs) by virtue of their substantial direct investment in various countries transcending national borders (Bartlett and Ghoshal 2000). These MNCs while adopting a global outlook tended to seek to develop standardized approaches based on the assumption that there are more similarities than differences across countries. In GSAs, the size and ability of the firm to make large-scale investments on infrastructure are no longer terminally limiting factors in whether or not they can undertake global work. Rapid upgrades in ICTs have reduced the cost of communication and increased the scope of operations so that relatively small companies can potentially have

business relationships and can address markets in different geographical domains. Small firms now have the potential to operate in the global marketplace by virtue of the knowledge capital they hold, the cost advantages they offer, and the potential they provide to serve as a basis to access new markets (Saxenian 2001). The multiplicity of networks in which these firms operate makes it difficult to categorize them on single dimensions of domains of work or countries of operations. They are better understood on their ability to develop and sustain networks that enable the flows of information, expertise, knowledge, and capital. Networks allow these firms to switch rapidly between local and global domains, and build competence in different functional areas and markets.

Firms doing GSW deal not only with strategic issues of whether or not they should globalise, but also with day-to-day operational issues including the creation of infrastructure, defining management processes, and developing language and cultural understanding of various contexts. One important operational issue concerns that of standardization, which is the focus of this paper. GSW is based on the assumption that software projects can be subdivided into relatively independent and autonomous modules, and pieces of work can be distributed and coordinated using ICTs across the globe. This modularization of work, its distribution across different development centers and subsequent integration requires standardization of various products (for example, the software development environment used), processes (such as software development methodologies) and also practices (such as reporting routines). This process of standardization is extremely complex as it involves questions of what and how much to standardize so as to best develop a pragmatic balance between the need for universal templates with the demands of local particularities.

In GSAs, the quest for standardization and efficiency can be viewed in the historical context of the software engineering tradition, and the continued attempt to impart structure and predictability into processes. This quest is reflective of firms' efforts to develop a 'global

strategy' (Bartlett and Ghoshal 2000) where the dominant underlying management perspective is that the world could, and should, be treated as a single integrated market based on similarities rather than differences. In GSAs, a constant attempt is to build and sustain a relationship by homogenizing operations to the extent that the outsourcing and outsourced firms cannot be distinguished from each other. For example, firms try to simplify and coordinate tasks by standardizing various processes of knowledge transfer, such as how project reports are written, and the criterion to judge the quality of a developer's work. These standardized systems, often codified in manuals and databases, and sometimes implicit and unwritten, serve as points of reference to coordinate work across time and space. Such attempts to standardize are rarely unproblematic, and in tension with the need for flexibility at the 'local' level. While some degree of standardization is essential to enable global coordination, there is always the question of how much and what to standardize? While it may be relatively simple to standardize technical quality control methods, it is harder to get managers from different backgrounds to communicate with each other similarly.

In a global environment as dynamic, interconnected and yet diffused in which GSAs operate, trying to standardize is like shooting at a moving target. In GSAs, the dynamism of the global setting and the diversity of the partners, projects and technologies involved make Hanseth and Braa's (2001) argument that the hope of creating a universal standard is an illusion, akin to 'hunting for the rainbow at the end of the rainbow' even more pronounced. The global contexts in which GSAs are situated are always being redefined thus making standardization attempts typically taking place within an inherently 'non-standardizable' context. However, with work simultaneously occurring in multiple distributed settings, some degree of standardization is essential, raising the complex challenge of how to forge a pragmatic balance between developing universal solutions and accounting for local reality (Rolland and Monteiro 2002)

In summary, at least three issues make this problem of standardization in GSAs interesting

and important to study. Firstly, the networked nature of GSW makes attempts to standardize a "moving target" as firms are constantly being subjected to new kinds of influences. Secondly, the ability to enter into GSAs is no longer restricted to large firms with the capacity to make financial investments, but is also populated with small and innovative 'born global' firms. Thus, the economies of scale of standardization traditionally associated with large MNCs often do not hold for such small firms. Thirdly, is the central role of ICTs for coordination of work, and also in defining the content of work. For example, the availability of bandwidth determines the degree of interdependence the projects can have. While ICTs help facilitate interdependent work, they come with their own challenges related to access, compatibility, protocols and standards, and issues of power and control.

This paper attempts to describe both the importance and the unique complexities that are associated with the problem of standardization in GSW. The analysis is based on a longitudinal empirical analysis of a GSA relationship between a large North American telecommunications MNC with an Indian software house. In the next section, some conceptual issues around the issue of standardization are discussed. This is followed by an elaboration of the research approach, and then the case study. The section following it describes the case analysis. Finally, implications for theory and practice are discussed.

Some conceptual issues around standardization

To understand the complexity of standardization in GSW, it is important to analyze the nature of GSW and how it differs from other domains of work where the problem of standardization has typically been discussed. We thus first discuss the distinctive nature of GSW, and then conceptualize the problem of standardization in this context.

Nature of global software work

Global Software Work (GSW) reflects characteristics of other forms of global work in general where the focus is on developing standardization, productivity, and efficiency. Ritzer (1996) labels such work as

'McDonalidization.' Based on an analysis of fast food restaurants, notably McDonalds, Ritzer develops a critique of current-day work practices and society as excessively concerned with institutions to rationalize and control behaviour. Drawing from Max Weber's views of rationalization, Ritzer identifies four dimensions of modern institutions: efficiency, calculability, predictability, and control. In GSAs, similar efforts are ongoing to standardize and make efficient work by for example, defining the template in which project-related communication takes place.

GSW involves the application of various kinds of knowledge systems including programming languages, software development methodologies, project management techniques, and the application domain. Different programming languages are used in software development for use in both general purpose and specialized domains. Large firms like IBM, Hewlett Packard, and Univac have formulated their own languages to support proprietary operating systems and system utilities. Users in other domains, for example Nortel Networks, a large telecommunications firm, had software for their digital switches written in a proprietary language called Protel. In the eighties, increasingly common platforms emerged with C and then C++ (considered 'open' platforms), which became widely used for system software development. Developers often prefer such open platforms, as they are not restricted to particular technologies, or to specific firms with their proprietary languages and products.

Although global work is not a new phenomenon, distributed software development work is relatively new and begs the empirical question: can approaches to global manufacturing (for example, car assembly plants) or global services (for example, consulting) be transferred seamlessly to software development work? As software work involves physically intangible artefacts whose value is derived from qualities like efficiency of algorithms, 'look and feel' aspects of the user interface, richness of features, and so on, this distinction from production of material goods is useful. Software work has distinctive features, for example, in contrast to manufacturing where production and consumption take place in

separate physical domains, services are generally distinguished by the inseparability of these functions. This would be true of a range of different services including hotels, medical to legal and accounting practices. However, these services are also starting to be outsourced offshore as reflected in the growth of firms providing legal and medical transcription services, and also those specializing in various transaction-processing functions like billing and ticketing.

Production and consumption are separable to a major degree in software work, where at each stage of the development, artefacts like program code and documentation enable outputs to be specified and disembedded from the development domain to other use situations. However, information systems research has increasingly established that software design and development is never really 'finished', but involves an ongoing interaction and redefinition with process of use (Bjerknes, Bratteteig and Espeseth 1991). Development and use of software can thus be quite distinct, linked together by various artefacts, and simultaneously be also intricately interconnected. Managing these complex interdependencies is a defining aspect of GSW.

Software is different from traditionally accepted knowledge work of consulting which has a primary reliance on the expertise of individuals which makes it difficult to obtain economies of scale. Software work covers a range of activities. On one end of the spectrum is creative work like the development of new algorithms and interface designs that that cannot be scaled up in a mechanical fashion. Friedman (1989) argues that attempts to discipline, formalize, and make subject to managerial control such work is thwarted by factors such as rapid changes in technology and the associated lack of skills in these new domains. On the other end of the spectrum is the work of call centres, data entry, and medical and legal transcription. Such work can easily be scaled up with a suitable work place and telecommunications infrastructure and the availability of large numbers of people with English and typing skills. In between these extremes, there is a range of activities that demand different degrees of knowledge and

skills, and are amenable to varying degrees of scaling up possibilities. The extent of separability and scaling, therefore, varies for different software tasks and is shaped significantly by the infrastructure, kind of work, available bandwidth, degree of sophistication of management processes, and prior experience of the partners.

In GSW, tasks at various stages of the software lifecycle may be separated and implemented at different geographic locations coordinated through the use of ICTs. Maintenance and testing were among the first tasks to be outsourced, while early life-cycle tasks like design and user requirements analysis were considered more difficult to contract out as they required intimate knowledge of the firm's work practices. On the face of it, those projects appear better suited for outsourcing that can be specified clearly. Design tasks are more complex to outsource as they assume a close familiarity of the market and user preferences. Alternatively, chunks of the software are divided into independent modules and its development 'outsourced' to teams in different locations.

Intangibility, heterogeneity, mobility, and scalability are features that have been described to differentiate software work from other services and also manufacturing activity. Mental or intellectual activity involved in software work is captured in a form not tangible in the literal sense of being touchable by a human hand but nevertheless is made perceptible through magnetic or optical readers and other devices. The heterogeneity of software work is often minimized with the standardization of development processes, methodologies and programming languages. While new design work involves heterogeneity at early stages of conceptualization and design, it may require less in the testing and implementation stages. Perishability, especially important in services like hotels, is not so in software since artefacts like software code and manuals provide mobility using ICTs, and enable the software to endure over time and space.

Another distinctive aspect of software work is the influence of social and human issues in the design, development, implementation, and the interpretation of the implications of software. In

GSW, these influences are magnified as they involve relationships of people, teams, organizations, from different countries, with varying spoken languages and styles of working. Whereas firms in the manufacturing and services industry may try to downplay national and cultural issues through standardisation, managers of some GSAs may capitalise on playing up local peculiarities, strengths, and creative energies. While large MNCs are widely seen as weakening dominance of local cultural values, smaller software firms in contrast may attempt to reassert local capabilities as a strategy to be globally distinctive.

GSAs allow for a range of possibilities both in terms of the kind of projects contracted and the extent to which the different stages of the development lifecycle can be outsourced. Traditionally, it was felt that only structured projects could be outsourced where file structures and outputs were completely defined, as compared to those whose outputs are more open to the users changing judgement on desirable features. Such projects, it was argued, are best done in-house in conditions of co-location and proximity. In addition, to reduce ambiguities in design, Kobitzch et al (2001) argue that structured projects are amenable to an 'engineering' approach which makes it easier to scale up and achieve economies of scale that justify investments required for establishing the needed infrastructure. An engineering approach requires a maturity and compatibility of structured processes in the vendor and client organisations. This situation has changed quite dramatically in present times with firms experimenting with various alternative development approaches.

In summary, we have discussed four distinctive features of GSW. Firstly, GSW does not reflect either a traditional manufacturing or service activity, and includes elements of both. Secondly, GSW can take on varying levels of sophistication and need for creative and intellectual inputs, ranging from call centres to the design of new technologies. Thirdly, the scalability of GSW varies with the nature of work and the life-cycle stage of the project. Fourthly, social and human issues are magnified in GSW due to the diversities of people,

practices, and technologies involved.

The standardization problem in GSW

In the context of GSW, standards are conceptualized as a *process of simplification and abstraction with the aim to define and communicate significant aspects of the processes, artefacts and structures across time and space. The aim is to enable some form of universalisation and mass production.* Standards represent agreed upon rules for the production of (textual or material) objects required because they span multiple communities of practice spatially distributed (Bowker and Star 1999). Although standards help to provide a sense of stability to those involved in using the infrastructure, as their temporal and spatial scope increases, they take on an increasingly inertial nature, making it difficult and expensive to change. Unlike some domains where standards are defined and enforced by external agencies (like the World Health Organization for health standards), standards in GSA relationships are conceptualized to be largely negotiated 'internally' at the social, political, and cultural levels by the involved parties. These processes of negotiation are referred to as 'standardization'. The interest in standards extends beyond the technical concerns of individual systems or the protocols to include the relationship in its totality, including standards for technical and physical artefacts, software development processes, and other formal and informal management practices.

Various forms of standards are encountered in our everyday life. They serve different purposes including being a *reference* (for example, weights and measures), to develop *compatibility* (between for example, a plug and socket), or to specify *minimum acceptable* levels (of software quality for example). The idea of a standard is linked closely to the notion of a "universal" implying that the same can apply to all activities and actors within a particular domain. The idea of standards is not new, and was an important aspect of Adam Smith's notions of routinization that served to split even the manufacture of a pin into different tasks and allocate to workers based on skills required. Instead of employing highly skilled and expensive workers to do the entire job from start to finish, sub-tasks could be

split up amongst less qualified workers. About a century and a half later, Fredrick Taylor's scientific management principles, based on similar concepts of routinization, increased the emphasis on productivity measurements of different sub-tasks based on pre-defined standards. While principles of routinization and standardization have been widely implemented in the manufacturing sector, in recent years have also been applied to the service sector. Leidner (1991) ethnographic analysis of Macdonalds and an Insurance company brings out beautifully processes of standardization as they play out in 'interactive service work'.

The extreme diversity and scope of standards in GSW requires a conceptualisation that is typically broader than past research that has focused on technical artefacts and infrastructures. For example, Hanseth (1996) describes standards with respect to basic communication protocols, their syntax, semantics and pragmatics of the information to be exchanged. Monteiro (1999) describes the implementation and deployment of relevant Internet standards, including the specification of communication protocols. Hanseth and Braa (1998) have examined in Norsk Hydro the implementation of the Hydro Bridge standard to improve coordination between various divisions and the corporate headquarters. Related research in the health domain (for example, Timmermans and Berg 1997) has focused on artefacts like medical protocols and the socio-political processes through which they are constructed and implemented. While such research has helped to understand how standards around artefacts or technologies are created, they do not explicitly account for the standardization of *management practices and processes*, and how these are redefined through everyday use.

In software development, standardization has been discussed in the context of 'internationalisation' of software packages (O'Donnel 1994, Taylor 1992). The aim of internationalisation is to develop and market packages in a 'mass-production' mode through appropriate language translation strategies that can account for cultural differences. For example, Taylor (1992) writes:

The end goals of internationalisation, then, are to be able to have a sort of generic package,

with an appendix or attachment that details all the cultural specifications (page 29).

While such internationalisation efforts take primarily a marketing perspective to support the development of products, GSW is quite different as it involves the management of processes and also products by which both services and products are jointly developed. GSA based firms have increasingly become too diversified to attempt tight central control, as they have simultaneously become increasingly embedded in different contexts where they need to deeply understand local particularities. This understanding is important to help develop common templates within which members can interact, share information and communicate with others. Typically, one location serves as the hub and is responsible for coordinating the different pieces of software development occurring in the various nodes of the network. Coordination is enabled by networked technological infrastructure, glued together with the use of standard product designs, development methodologies, and benchmarked management processes that serve as 'best practices'.

The various pieces of technological and managerial infrastructure that underlie a GSW are held together by various standards -- formal and informal, explicit and implicit -- and represent expert processes that Knor-Cetina (1999) describes as being characteristic of contemporary 'knowledge societies.' Knowledge required for the functioning of GSAs is not merely an intellectual or technological product that is external, but a production context that is developed over time and comprised of heterogeneous elements bound together in a widely extended network. GSAs are fundamentally facilitated by complex socio-technical 'information infrastructures' (Hanseth 2001) including high-bandwidth telecommunications links, management practices and procedures, and software development methodologies and practices. This infrastructure needs to be sustained through a shared understanding in both the technical and management domains about how software development work should go on, reflected, constrained and enabled in the existence and use of various standards.

Given this background on the nature of standards and the scope of its application, the empirical research approach is now presented, followed by the case narrative.

The empirical research approach

The empirical research involves the study from 1996 to 2000 of a GSA involving GlobTel, a pseudonym for a large North American telecommunications firm (current size about US \$ 20 Billion), with WS (a pseudonym for a large Indian software house). The empirical work aimed at understanding the processes of change in the GSA relationship by seeking interpretations from both GlobTel and WS managers about the status of the relationship, the different challenges being experienced and how they were being dealt with. Over the 4-year period of the research, 25 interviews were conducted of GlobTel employees and 15 from WS. Interviews with the GlobTel employees took place in three different locations including their North American head office, their UK lab that was closely aligned to WS, and their expatriates in India. All the WS interviews were conducted within their lab in India. All interviews were semi-structured focussing on issues that had been identified as important by the respondents or the researchers.

An initial set of interviews conducted with GlobTel employees in their North American office in November 1996 helped to historically reconstruct the relationship, and to understand some of the perceived future challenges. Subsequently, in February 1997, interviews were conducted with WS staff in India. In each of the three subsequent years, the WS site was visited at least once to help develop a longitudinal perspective on the challenges, their responses, and future expectations. Some of these interviews included repeat meetings with key respondents. Interviews with people from both GlobTel and WS helped to gain an understanding of varying perceptions on similar issues, and also the different issues that were considered salient by both sides. The repeated visits and meetings with staff helped the respondents to develop a sense of trust with the researchers that led to a freer mutual sharing of opinions. This sense of trust was also strengthened by the fact that the research team

provided periodic reports to both organizations that summarized their opinions of the state of the relationship.

Interviews were either transcribed if tape-recorded or elaborated upon from notes made in the interview. These notes then became the focus of discussion between the different researchers in order to develop interpretations of various themes. These themes were then related to various theoretical concepts, including standardization that is the focus of this paper. Thus the approach to data analysis involved a continuing dialogue between data collected, interpretations, and feedback from the case participants, discussions with colleagues and our continued reading of related literature.

Case narrative

WS is part of a large Indian business conglomerate dealing with an extremely diversified set of products and services with an overall turnover of US \$450 million in 1996. WS was the biggest contributor to this with a US \$300 million turnover. With the growth of the domestic IT market relatively slow, in 1988 WS turned its attention to the international market with a focus on systems integration solutions. The telecommunications division of WS entered into a GSA relationship with GlobTel in 1991. In retrospect, GlobTel and WS had varying views on the motivations for initiating the relationship. Senior directors in GlobTel described their motives to be based on "resource considerations" and to develop 'headcount flexibility' for GlobTel. Barry, MD of the GlobTel UK lab saw WS's expectation of 'going up the value chain' as unrealistic:

I don't agree with your analysis that when we started we looked at India in any other way than for cost reduction. We never saw it as a place for development of new technology...The idea for us was to free up people and money over here given the constraints and conditions of the market by moving some development to Bangalore. So, the basic strategy was opportunistic.

Initially, a group of WS engineers went to GlobTel's North American office for six months and returned to Bangalore with testing projects that could be done by the Indian engineers logging into the GlobTel's server in North

America. These projects were rather "independent" and did not require extensive everyday interaction with GlobTel or independent communication links. With growth in technical expertise, WS started doing feature development projects, which Reddy, a senior WS manager, described as a movement from 'peripheral' to 'core' activities. This led to upgrading of infrastructure by establishing communication links in 1993. The WS Technical Manager Ram described this as an event of great significance because with the links in place, the volume of work increased significantly and the 25 WS developers in 1993 increased to 220 in 1996. In 1996, the GlobTel account was worth about US \$ 8 million, WS's second largest account organization wide and contributed to sixteen percent of their total software exports.

GlobTel made significant investments (to the tune of about one million US \$) in establishing communication links and transferring switching equipment for simulations. WS reciprocated by setting up an independent lab in 1995 and acquiring the required workstations. These mutual investments, despite the absence of a formal and legally binding long-term contract, signified a relationship in which 'the spirit went beyond the terms of the contract' (Krishnan, the WS CEO). There was a growth in intimacy and a sense of exclusivity in the relationship, in line with WS's ambition of becoming a 'preferred lab where anything GlobTel wanted in India can be achieved through us' (Krishnan). The goal of a preferred lab implied a continuous evolution in work, moving from testing to feature development and finally ownership. Ownership, a desired end-state, implied becoming fully responsible for the maintenance, enhancement and support of particular sub-systems transferred to WS. In this state, WS owned the architecture, the code, and did all the approvals for any change in code. However, ownership did not imply control over intellectual property, which was hundred percent GlobTel owned, a clause built into the initial contract.

Since inception, GlobTel seemed to have consciously selected WS to be the 'hub' for their existing four Indian GSA relationships. GlobTel routed their telecom links through WS to the four partners, and WS conducted, on GlobTel's,

behalf training programs for the other partners. GlobTel located four of their expatriates on WS premises, three specifically to support WS activities and the fourth to oversee their India-wide operations. Joe, one of the expatriates, described his mandate to 'help them (WS) understand what GlobTel's expectations are.' GlobTel consciously tried to integrate the WS group into their activities, by their managers in North America placing their group's annual operating plan on the Intranet that could be accessed by WS, and contribute to their sense of 'inclusion.' WS consciously attempted to replicate GlobTel's office environment and management style, reflected in Krishnan's statement that *operationally, we work as GlobTel and there is no difference. We have a similar set up as GlobTel.* As a sign of long-term commitment, WS established a new telecommunications division in their organization structure and set up management levels that could be mapped to those of GlobTel. A WS project leader described *the styles of management; the division of the hierarchy we are following is exactly like GlobTel. We have the same kind of structure.*

WS considered learning and adapting best practice models from others as central to its culture, and did not see it as copying. Krishnan argued that *people, the world over compare, and there was no reason to be upset if they adapted best practices from GlobTel like their competence model.* He gave examples of how WS had adapted global best practices like GE's Six Sigma methodology. However, in this process of adoption, some WS managers like Reddy felt that WS may be getting compromised as *my people move more towards GlobTel than to WS and our identity is more with GlobTel.* She was concerned with the way in which *the GlobTel way of being has seeped into everything.*

Gradually, over time a number of GlobTel's technical and management processes were introduced into WS. These helped to provide GlobTel managers with a sense of comfort that their processes and quality levels were being standardized in India, including systems for planning, reward and recognition, and training. Some quotes below reflect the extent of the standardization efforts.

We plan out in detail, there are elaborate plans for each of these individual projects the way GlobTel plans (Krishnan, the WS CEO).

I go to North America once or twice a year, two-three weeks. We get exposed to and get to know their planning systems, and after working with it for a while, you get to know what to do and what not to do. I think that is how I got to learn my management skills, looking at them, how they do, try to get their feedback, and adopt it here if possible (Reddy, a senior WS Technical Manager).

Actually, for appraisal we have a specific thing, what we say is project management, which includes client and project management. We have a similar appraisal program as they, and we fill in the same stuff. These standards are GlobTel predominantly (Krishnan, the WS CEO).

Actually, we also have a spot award. It is famous, the GlobTel spot award, actually it is also their initiative (Ravi, a WS Project Leader).

These processes of standardization were not without their own tensions. For example, Reddy lamented that *despite being an ISO 9000 certified company, with excellent internal processes, our processes are not accepted by GlobTel*. Reddy saw GlobTel as an extremely large and structured bureaucracy that was often overbearing on WS. This tendency to “dictate” was seen to be paradoxical when compared with GlobTel’s normally ‘open’ management style. GlobTel felt ‘micro-management’ was required since WS did not understand their expectations. WS initially resisted the presence of expatriates however, with time their value was realized in solving problems. Also, with time, the expatriates too became more realistic about what could be achieved. Through the presence of the expatriates and the frequent travels of WS and GlobTel managers to the each others’ office, a number of GlobTel practices were introduced in WS. This led to apprehension in some quarters within WS that traditional strengths arising from their ‘community’ style of working was being eroded at the expense of the individualistic North American style.

After working together for five-six years, both WS and GlobTel felt that they had developed a level of mutual understanding and appreciation

of each other’s weaknesses and strengths. Increasing investments from both sides contributed to an evolution in work, but with it came with rising GlobTel’s fears about WS’s capability to deal with the problem of attrition of WS staff. Reddy found GlobTel’s increasing concern with attrition to be unfair as it involved comparing GlobTel’s many decades of experience in telecommunications with WS’s recent entry into the industry. While she felt that GlobTel should clearly define their parameters and let WS take control of the process, GlobTel did not feel comfortable about this because of WS’s perceived workforce instability. WS was extremely sensitive to the need to develop a stable workforce, which was now about 250-280 strong. To retain them, WS developed initiatives like the ‘three years’ and ‘five years’ policies whereby a WS employee on completing three years could spend a year in North America and after five years be given an option to become a GlobTel employee. In an interesting and radical move, GlobTel appointed Chandra, the WS HR manager, on a two-year secondment as their India Prime and reporting primarily to GlobTel. Chandra’s mandate was to create common training programs for all GlobTel’s India partners and to standardize the skill sets of Indian managers to fit the mould of a ‘uniform GlobTel manager’. Chandra expressed excitement at her mandate:

I think it is a brilliant model been made by a top consultant and it specifies the level you are with respect to your competencies and what you are required to achieve. This way everyone speaks the same language. So, at the same level whether you are in Company A or B, there is the same level of skills required. There is standardization. By developing a ‘Global manager’, GlobTel can leverage it for different contexts because the cultural framework they are using is quite the same. There is standardization. GlobTel has so many D-Level managers, for example, all over the world, and using these standardized systems they can take a quick look at the level of the skills set to determine the overall competency. While the roles and competencies are the same, the managers are of course different. So, India and UK can be merged and made one. I believe the standards and competencies of GlobTel managers are higher than what it is here. We

are trying to culturally change some of the behaviours of the managers here. Then at the same level, depending on the behaviours that are exhibited, GlobTel can possibly reward them. By developing a 'Global manager', GlobTel can leverage it for different contexts because the cultural framework they are using is the same. Culturally, we can change them and make them more aware. The model is generic in nature. You may have the most beautiful eyes, nose, and mouth, but put together the impact may not be so good. It depends on how things fit together. The model is generic and it covers 22 spheres.

Chandra tried to introduce various 'best practices' within WS including a quantified system for performance measurement called the 'Performance Dimensions Dictionary' (PDD). The PDD served as a new 'common language' to describe employee competencies and serve as a reference document to develop standard techniques for identifying and measuring competencies. With this quantification and standardization, it was expected that WS managers could be compared with others, and their own performances monitored over time. An internal document described the PDD as follows:

It is intended to be a reference document for people in GlobTel globally who want to identify ways to improve performance and to establish objective assessment of performance. The common reference point will help provide the objectivity that is needed to ensure fairness, and connect people processes such as recruitment, development, appraisal and training right across the organization.

In addition to the PDD, a number of other quantified systems were introduced to develop measures of productivity, competency measurement, and attrition monitoring. GlobTel introduced a system of monthly quantitative reporting of lab productivity. After some early resistance, this system was formally introduced. A local practice of not quantitative reports was thus subsumed within GlobTel's standard reporting framework to enable their managers to interrogate the performance of Indian labs through global comparisons. Another quantitative system was the self-assessed 'user satisfaction reports.' Initially, this system was

also resisted by some of the Indian labs but subsequently accepted due to GlobTel's insistence. Such quantitative models help to provide a common basis to compare processes across time and space, and serve as 'non-human actors' (Latour 1987) who spoke 'on behalf' of GlobTel in WS.

The use of expatriates and consultants was a particularly strong technique to develop stronger 'inscriptions' of GlobTel standards. The term inscription is used in the same sense as Callon (1991) when he says "an inscription is the translation of one's interest into material forms" (page 143). Interestingly, many of the expatriates were of Indian origin with many years of prior experience with GlobTel in North America. They were thus expected to have both an understanding of the local culture to enable effective communication with the Indians, and be sufficiently integrated into the broader GlobTel system. Typically, the expatriates were seen to believe in the superiority of Western management practices and standards over the Indian processes. They defined their mandate to 'introduce the GlobTel way of working in WS,' and to make 'WS understand better the nature of GlobTel's expectations,' and to make the Indian system more 'objective' and 'accountable' like their own.). The expatriates served multiple roles of exercising control through micro-management, be a useful resource for solving mostly technical problems, and help introduce and reinforce the GlobTel culture in and through WS to the Indian partners. Similarly, Edstrom and Galbraith (1977) have argued that managers are often sent from the head offices to their subsidiaries as a means of control (Kamoche 2000).

Training was another important translation mechanism to help build similar approaches for developing technical competence, and create common cultural and linguistic frameworks. There is an integrative relation between management training and the development of a shared culture. Training serves as a tool for the transmission of culture, which in turn furnishes the rationale for training (Kamoche 2000). Organizational values incorporated in training courses assume legitimacy by becoming part of the knowledge required for job performance and career advancement. In international

management, training efforts need to go beyond simple skill and competence formation to the more complex domain of how knowledge can be transmitted and interpreted across cultures. The complexity arises from the fact that such knowledge has both functional and symbolic values since it appeals both to the managers, self-interest (career advancement) and to their sense of ideology, in this case inscribed in Western management practices.

In 1998, arising from the tremendous churn in the telecommunications industry, GlobTel needed to cope with the pressure of developing new Internet-based technologies rapidly. They embarked on the strategy of acquiring start-up technology companies (for example, from Silicon valley) rather than investing heavy amounts on in-house R&D. In reaction, WS also needed to enter new technology areas and develop patents, instead of passively waiting for GlobTel to transfer technology. Such a reorientation was difficult since it would need WS to have greater exposure to the end-users primarily based in North America. In the light of global uncertainty, Barry (the UK lab MD) felt WS's expectation of gaining intellectual property ownership to be unrealistic. It had been hard enough for GlobTel to give new technology work to their own UK lab, and so the possibility of Bangalore getting such projects was indeed remote. GlobTel were confronted with the issue of whether WS should be used for supporting legacy or new technologies. Subsequently, GlobTel decided to use WS primarily for legacy systems work, which WS accepted as they felt they would gain a steady volume of work. Reddy rationalized:

I think the right angle turn has helped us a lot. They (GlobTel) realized that they have to move on, they cannot hold on to a product hundred years old or whatever. The CO 24 (pseudonym for GlobTel switching products) is making US \$500 million today. And SM 50 (another pseudonym) is also making a lot of money. So it is not going to go away. But they (GlobTel) may not stick to this because if they do their market opportunities in ten years will go down. So they have to do more work in the packet and data area. So they need a place to give the existing products. It really is a good technology for us to understand; definitely it is not in the data area

or other fancy areas. We realized that there is a business case.

A key challenge for WS in accepting the legacy route was in trying to retain the young talented programmers who wanted to work on state-of-the-art technology rather than DSP. Another challenge was that DSP technology represented a 'shrinking pie' from which budgets would be constantly redirected to the "right-angle turn." So, although DSP legacy work might guarantee a certain level of work for future years, there was constant pressure that work would have to be done at reducing costs. Also, there was pressure to continue to work on a pricing basis that WS felt was increasingly getting outdated. In the words of Venkat:

My own feeling is that the current model is dying, maybe within two-five years. It is a very simple equation, if the cost goes up at the rate of thirty percent and the prices do not go up and it is only dependent on the rupee depreciation of five-six percent, no mathematics is required to find out whether in the third or fourth year you would be profitable or not. People are going to pay more dollars for higher value-added work, and how you are to provide that, is the big question. We need a different model wherein we get value for money rather than based on counting the number of people.

In the next section, we analyse the process of evolution of the GSA relationship using the conceptual lens of 'standardization,' and the underlying tensions that were involved.

Case analysis: a standardization perspective

The nature and scope of standards

Like many other large MNCs, GlobTel was active in establishing offshore software development centres (like WS) globally. Coordinating work in these different centres raised the need for multiple standards that served to simplify, abstract and communicate significant aspects of the GSA processes, artefacts and structures across time and space. From GlobTel's perspective, standardization was desirable, as it would help to make better use of resources, improve coordination, and enable more effective sharing of information and knowledge across the partners. Standardization included physical and technical

infrastructure, and other technical and management processes. The nature and scope of these standards are now described.

Physical infrastructure includes physical buildings, office layouts, coffee machines and even the badges worn by the WS staff working on GlobTel projects. WS established a separate building and tried to create an office layout that replicated the GlobTel North American set-up. These 'physical standards' provided a sense of exclusivity to the GSA within WS, and helped the GlobTel's expatriates with a sense of comfort by 'as if still being within the GlobTel North American environment.' *Technical infrastructure* includes a number of items including workstations, replicated servers, networks, switches for testing, software tools for configuration management, programming languages, telephone lines, etc. For example, in WS, a person could pick up the phone and dial a counterpart in GlobTel using just the extension number, as if in the same building. GlobTel specified the use of a proprietary language as the development platform, which although helping to standardize the technical implementation process, made some developers feel they were being prevented from 'speaking' to others in the global marketplace, thus impeding their marketability and movement. *Technical processes* include the software development methodologies, processes for quality assurance and other documentation. For example, elaborate software development methodologies were in place that specified various 'gates' and 'hand-off' dates for project deliverables. *Management processes* includes particular procedures and practices for personnel appraisal, lab productivity measurement, and the matching of the organizational structure, management hierarchies and reporting relationships of GlobTel with WS.

The above discussion emphasizes the different and wide scope of standards in GSAs ranging from the global domain of software development methodologies to the very local level of employee badges. Some of the standards are open, for example, the CMM quality levels while others are proprietary GlobTel's development platform. Coordinating these very diverse types of standards involve

various mechanisms of "translation" to 'interest (or impose on) others in your concerns.' An analytical focus on standards and the translations that surrounds them helps to emphasize how and why standards shift. A key challenge is manage the inherent tension between the need for stable standards on one hand and for flexibility on the other Hanseth et. al.,1996). Flexibility here refers to the potential to change or not accept global standards. A larger aim of translations is to create a technical, cultural, managerial and physical template in which employees, both from GlobTel and WS, could feel as if they are operating within the GlobTel North American framework. While a standard template seeks to create efficiencies in coordination and create economies of scale through the sharing of resources, they come with their own tensions.

In summary, the case can be seen to start through an initial phase when both sides had particular (mismatched) expectations about what can be achieved by them through the GSA. However, on one aspect there was congruence, WS wanted to become GlobTel's preferred lab while GlobTel saw WS as a hub for their India operations. The work done by WS during this phase was rather standalone and the standardization efforts were primarily aimed at the physical domain (building, office layout badges etc). As the relationship started to mature and WS gained greater understanding of the technical domain, they started to do more feature development work and engaged in ownership transfer. With this, the emphasis in standardization started to shift towards the more technical and later to the management domains. The tensions associated with these processes are now discussed.

Standardization, tensions, and the GSA process

GlobTel's strategy of making WS their India hub provided the broad framework on which the relationship was built. By establishing an independent telecommunications division within their organizational structure, WS sought to create a common basis to standardize and make practices compatible with GlobTel. The early establishment of a GlobTel lab in WS helped to provide exclusivity and a sense of belonging to the WS staff, and with growth in GlobTel's

confidence, the relationship proceeded rapidly.

Standardization was aimed attempted in various physical, technical, and managerial domains. The independent lab served to create an exclusive 'GlobTel island,' where even WS employees from outside the GlobTel group had restricted access. This exclusivity was reinforced through WS staff wearing badges with 'GlobTel' logos and an office layout with a similar 'look and feel' of GlobTel. On the surface, this segregation provided security, but at a deeper level, it made a predominant GlobTel frame of reference very visible in WS. This physical structure was reinforced through electronic mechanisms like General Information Sessions, newsletters, bulletins, and the Intranet, which inundated WS employees with information about GlobTel, and there was always a talk about GlobTel. This was sometimes at the cost of interest in WS.

At the technical level, the ICT infrastructure played a key role in developing standard frameworks in both a material and symbolic sense. This reflects Akrich's (1992) argument that 'technical objects thus simultaneously embody and measure a set of relations between heterogeneous elements' (page 205). For example, the telephone link that enabled a WS staff to ring a counterpart in North America and vice-versa as if they 'were within the building,' symbolically fostered for WS a sense of "inclusion" in the relationship. The software development environment was established in WS such that work could go on in India 'as if it was taking place in North America.' Frequent videoconferences, emails, phone calls, information exchange, travel and the presence of expatriates helped impose in WS the 'GlobTel way of doing and thinking about things.'

WS seemed to be willing to serve as GlobTel's Indian hub, and their resistance to this seemed relatively milder and less explicit than that of the other Indian partners. On the contrary, they seemed to express a sense of openness and eagerness to learn and adapt GlobTel's 'best practices.' This adoption took place at multiple levels from organization structure to project management practices, to employee reward and recognition schemes down even to the employee badges and language used. The secondment of

the WS HR manager to GlobTel represented an extremely powerful way for GlobTel to develop stronger inscriptions of their standards. The dominant GlobTel system of information, activities, and structures made some WS managers question the allegiance of their staff.

It is interesting to examine how the standardization efforts progressed over time. In general, an increase in standardization initiatives was accompanied by rising levels of work (from initial bug fixing to feature development to ownership). With a steady increase in quality (from peripheral to core technologies) and volume (large-scale ownership transfer) of work, there was an increasing need to move the standardization focus from the technical to the management domains, especially relating to systems of human resources management, and culminating in the attempt to create the 'global GlobTel manager' framework.

Expatriates drawn primarily from GlobTel's International R&D group (GRDG) were key actors in guiding initial standardization initiatives including of infrastructure, office spaces, and technical know-how. As ownership transfer processes gained ground, WS started having more direct linkages with the development groups (like the UK lab), the GRDG role started to become redundant. GlobTel started to slowly phase out the GRDG set-up from India. So, somewhat paradoxically, with increased standardization, GRDG, the agency that had been responsible for setting up this infrastructure, was withdrawn. Metaphorically, GRDG served the role of setting up the scaffolding of the building, and once that was done, the scaffolding itself became invisible.

The metaphor of a scaffolding provides an insight into Latour's (1999) question about 'what is gained, what is lost, and what remains invariant in the process of translation?' Latour raises this question in his discussion around the notion of a 'circulating reference,' and how the idea of standardization is tied up with the concept of 'invariant.' He writes:

A reference is not simply the act of pointing or a way of keeping. Rather it is our way of keeping something constant through a series of

transformations. What a beautiful move, apparently sacrificing resemblance at each stage only to settle again on the same meaning, which remains intact through sets of transformations. The rupture at each stage of the 'thing' part and its 'sign' part. The details are often lost, and what remains is the horizon, the tendency. Reduction, compression, marking, continuity, reversibility, standardization, compatibility with text and numbers – all these count infinitely more than adequatio (does this mean resemblance) alone. No step – except one – resembles the one that precedes it, yet in the end when I read the field report, I am indeed holding in my hands the forest of Boa Vista (page 56).

Latour emphasizes that standardization involves a process of small translations where some form of a 'global standard' is introduced at the local level and activities are subjected to a degree of redefinition with reference to this standard. This introduction and comparison takes place through a series of translations involving a process of dialectical interaction between the local and the global, where something new is gained, something is lost, and something remains the same. The invariant part of this process of translation reflects the strength of the standard. In Latour's Boa Vista case, the Munsell number acts as the reference that is quickly understandable and reproduced by all the colourists in the world on the condition that they use the same compilation. It allows crossing of the threshold between the local and the global. In our case, what remains invariant can be conceptualised in terms of the scaffolding used to set up the structure of the relationship, including various technical, management and physical routines.

At one level nothing has remained the same, as it happens with everything else with the passage of time. Initially, WS did not have a strong expertise in telecommunications or in GSA, and GlobTel helped them to develop that. Through a series of contested and uncontested translations, WS incorporated a number of GlobTel's management processes to create a 'WS-GlobTel hybrid,' albeit with a dominant GlobTel reference. What is gained thus is this new technological and business expertise, a steady legacy telecommunications business, and

management values shaped strongly by GlobTel. What may have been lost in this process are some high-quality staff who did not want to be limited by GlobTel's legacy work, erosion or redefinition of who WS are, and perhaps some local work practices being superseded by GlobTel's processes.

While gaining and losing are hazards that organizations have to engage with in the present context of globalisation, a complex and standing question concerns what remains invariant in this process of translation, which reflects the strength of the inscriptions. When the scaffold is removed, the building is left behind. Even though people who live in the building may change over time, and it could be used for purposes different from those previously intended. While the structure has a defining influence in the nature of these changes and redefinition, it itself changes with time. The WS structure has now changed to a large degree with the GlobTel influence, including the physical building, the technological infrastructure, the expertise, and the management structures and processes.

There is an ongoing discontinuity and continuity, although in WS we may identify a stronger tendency towards continuity. This tendency is something that people knowledgeable about the software industry in India would associate with WS - a reputation for being relatively passive, being conservative with an extremely good business sense, and to keep a low profile despite extraordinary financial successes. The company has been a key influence in shaping the larger trajectory of the industry. With the decision to accept the legacy route, WS took the path to enter areas that made excellent business sense rather than jumping into risky ventures that would involve cutting-edge technologies. From that perspective, accepting the legacy route can be seen to reflect and reinforce some of the existing 'low-profile' tendencies, some of which, it could be argued, have remained 'invariant.'

The case, to a certain degree, points to the futility of attempting to build 'universal standards,' since they are constantly redefined, negotiated, reinterpreted and applied differently. Hanseth and Braa (1998) have argued that

attempts to create universal standards often lead to the opposite effects of creating complex and 'non-standardized' systems. The interesting is not how the technical contents of particular standards are best applied in universal settings, but how different local particularities interplay with these standards to redefine their meanings at both the universal and local levels? And, how global standards are embedded or not into local practices, and how actors respond to these improvisations? In a similar vein, Berg and Timmermans (1997) argue that although universals exist, they only do so as *local universals*, embedded into local infrastructures and practices, paradoxically as a multiplicity of universalities. It is not the matter of dismissing universal standards or celebrating local particularities, but of developing a 'pragmatic balance' (Rolland and Monteiro 2002) that blends the universal and local in particular contexts.

In summary, this paper can be seen to make at least two contributions to the domain of information systems research. Firstly, it helps to elaborate on the complex and diverse forms of standards that come into play in the management of GSA relationships. An important point emphasized in this paper is that we need to take a broader view of standards than that taken in prior IS research, and the physical and managerial domains of standardization efforts needs to be given equal importance to the technical. The second contribution comes in the form of emphasizing the extremely dynamic nature of standards, and analyzing some of the mechanisms through which these changes take place, in the particular context of a North American-Indian GSA relationship. These mechanisms are shaped by individual actions, organizational policies, industry wide changes, and changing expectations within a processual relationship. The analysis presented in the paper can be useful to practicing managers in understanding the limits of what can be standardized and how much. More broadly, the study helps to point out to some of the limits of what can and what cannot be achieved within the framework of globalization.

Acknowledgements

I acknowledge the comments received by Eric Monteiro, Marc Berg and two other anonymous reviewers. The comments received at the Oslo-Cambridge Workshop in December 2002 was also very useful for the development of the paper. I acknowledge the inputs of the various colleagues who were involved in the empirical program of the research on Global Software Alliances. I acknowledge the friendship and support of Brian Nicholson in the research process that has spanned many years and countries.

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